

Funding Request: Gunshot Noise and Birth Outcomes

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This project studies the effect of gunshot noise on birth outcomes. We request \$2000 of funds for a purchase of the California Department of Public Health (CDPH) birth records data.

1 Objectives and Significance to Research Agenda

1.1 Objectives and Project Overview

The effect of adverse birth outcomes on later-life human capital accumulation, labor market outcomes, and overall health is well-established in the literature. Children born with low birth weight or born prematurely have a higher probability of dropping out of high school, leaving the labor force, earning lower wages, and suffering from worse overall health in adulthood ([Case, Fertig, and Paxson 2005](#); [Johnson and Schoeni 2011](#); [Salm and Schunk 2008](#)). In-utero exposure to stress is vital in generating adverse birth outcomes ([Almond and Currie 2011](#); [Almond, Currie, and Duque 2018](#); [Aizer et al. 2016](#)). Past research documents that area-level stressors such as high local homicide rates carry the potential to depress birth outcomes ([Brown 2018](#)). This is because the fear of becoming a victim of crime is associated with adverse mental health outcomes, such as stress ([Robinson and Keithley 2000](#)). To the best of our knowledge, past literature has not yet quantified the impact of fear of crime as proxied by hearing gunshots on birth outcomes. We hypothesize that an increased incidence of gunshot noise in the neighborhood of mother’s residence during pregnancy will be associated with higher risk of preterm delivery and lower infant birthweight. More specifically, the main research question is: Does exposure to high levels of gunshot noise during pregnancy negatively impacts birth outcomes of mothers in California? Intuitively, we will be comparing mothers who experience gunshot noise close to their home to mothers who live slightly farther away.

This research involves matching two particular data sets: ShotSpotter data (publicly available) and CDPH birth records data (requesting for purchase). First, the Shotspotter data contains geolocated information on gunshots that are heard across a city. These gunshots are identified by microphones that can triangulate the location of the gunshot fire. Second, and more importantly, the CDPH data includes the universe of all mothers who experienced a birth in California. This data includes rich covariates including mother street address, apgar score, type of birth, infant birthweight, and infant mortality. By merging both of these data sets by geolocation, we will create a novel data set that can map gunshot noise to a mother’s home address.

1.2 Significance to Research Agenda

This paper is planned to be a chapter in each of our dissertations. Both of our research agendas intersect between the economics of health and the economics of crime. While each of us want this to be a chapter in our dissertation, the primary goal is for this project to become a published journal article.

2 Necessity of Funding

The CDPH birth data is priced at 2000 dollars. Given that our study focuses on birth outcomes, this data is necessary to complete the project. While there are other US states that provide this data free, we are constrained by the availability of the ShotSpotter data. In particular, ShotSpotter only covers certain cities in the US due to the costly implementation of microphones and their questionable effectiveness in controlling crime. However, Shotspotter provides substantial coverage in California with 13 unique cities. These cities have large variation in both size (e.g., San Diego/Salinas) and crime-rates (Oakland/Palo ALto), thus giving more flexibility in our analysis.

3 Schedule of Paper

The paper will be completed in the following timeline. Note that this is a rough approximation.

- **Summer 2022:**
 - Exploratory analysis of Shotspotter and CDPH data.
 - Geocoding the CDPH data and merging the two data sets.
 - Further exploratory analysis/preliminary results.
- **Fall 2022:**
 - Refine results and perform necessary robustness checks.
 - Create first draft of paper based on results.
- **Winter/Spring 2023:**
 - Present results in AMEL and refine paper.
 - Based on comments, send to journals for publication.

4 Detailed Budget

For this project, we request \$2000.00. This will cover the cost of purchasing the necessary CDPH data.

The breakdown of the project budget is as follows:

- **Funds Requested:** \$2000.00

- **Budget Breakdown:**

- 2000 Birth Data (Data Creation Fee) - \$500
- 2001-2020 Birth Data (\$75 x 20 Additional Years) - \$1500
- Total: \$2000

References

- Aizer, Anna, Shari Eli, Joseph Ferrie, and Adriana Lleras-Muney. 2016. “The Long-Run Impact of Cash Transfers to Poor Families.” *American Economic Review* 106 (4): 935–71. <https://doi.org/10.1257/aer.20140529>.
- Almond, Douglas, and Janet Currie. 2011. “Killing Me Softly: The Fetal Origins Hypothesis.” *Journal of Economic Perspectives* 25 (3): 153–72. <https://doi.org/10.1257/jep.25.3.153>.
- Almond, Douglas, Janet Currie, and Valentina Duque. 2018. “Childhood Circumstances and Adult Outcomes: Act II.” *Journal of Economic Literature* 56 (4): 1360–1446. <https://www.jstor.org/stable/26570577>.
- Brown, Ryan. 2018. “The Mexican Drug War and Early-Life Health: The Impact of Violent Crime on Birth Outcomes.” *Demography* 55 (1): 319–40. https://ideas.repec.org/a/spr/demogr/v55y2018i1d10.1007_s13524-017-0639-2.html.
- Case, Anne, Angela Fertig, and Christina Paxson. 2005. “The Lasting Impact of Childhood Health and Circumstance.” *Journal of Health Economics* 24 (2): 365–89. <https://doi.org/10.1016/j.jhealeco.2004.09.008>.
- Johnson, Rucker, and Robert Schoeni. 2011. “The Influence of Early-Life Events on Human Capital, Health Status, and Labor Market Outcomes Over the Life Course.” *The B.E. Journal of Economic Analysis & Policy* 11 (September). <https://doi.org/10.2202/1935-1682.2521>.
- Robinson, Fred, and Jane Keithley. 2000. “The Impacts of Crime on Health and Health Services: A Literature Review.” *Health, Risk & Society* 2 (3): 253–66. <https://doi.org/10.1080/713670168>.
- Salm, Martin, and Daniel Schunk. 2008. “The Role of Childhood Health for the Intergenerational Transmission of Human Capital: Evidence from Administrative Data.” IZA Discussion Paper 3646. Institute of Labor Economics (IZA). <https://econpapers.repec.org/paper/izaizadps/dp3646.htm>.